WM-A53/B53

SERVICE MANUAL

US Model
Canadian Model
WM-A53
AEP Model
E Model
WM-B53

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MT-WMA53

SPECIFICATIONS

Power requirement 3 V DC, two R6 (size AA) batteries
Battery life (hours)

Batteries	Playback
Sony battery SUM-3 (NS)	approx. 3
Sony alkaline battery AM3 (N)	approx. 7

Accessories supplied
Belt clip (1)
For Canada, Europe and U.K.
Stereo headphones (open-air type, 1)
For the other countries
Stereo earphones (open-air type, 1)

Design and specifications subject to change without notice.

Note
This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

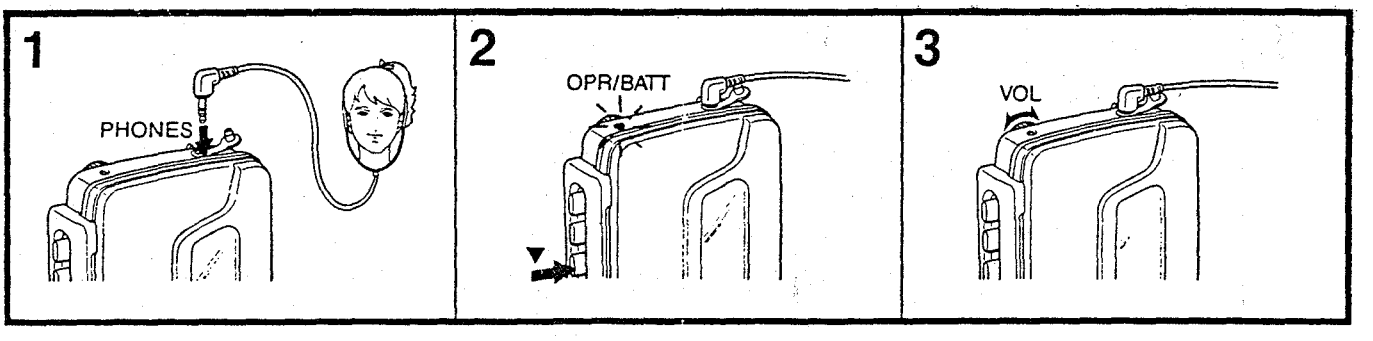
MICROFILM

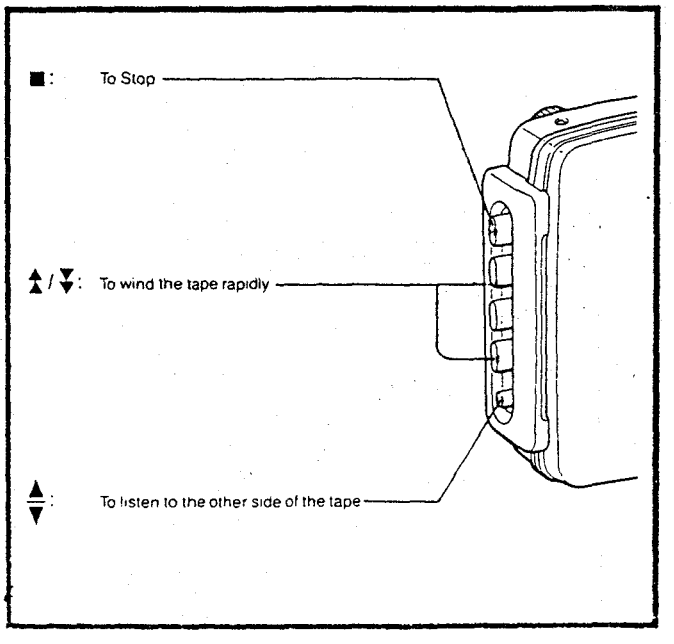
CASSETTE PLAYER

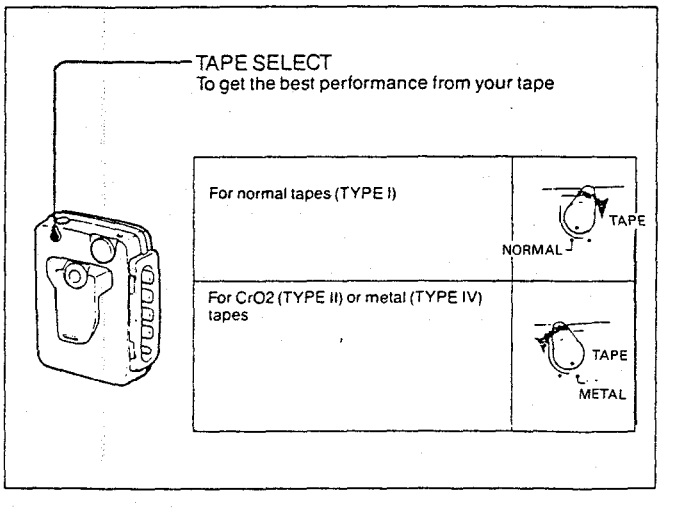
SONY®

SECTION 1
GENERAL

LOCATION AND FUNCTION OF CONTROLS

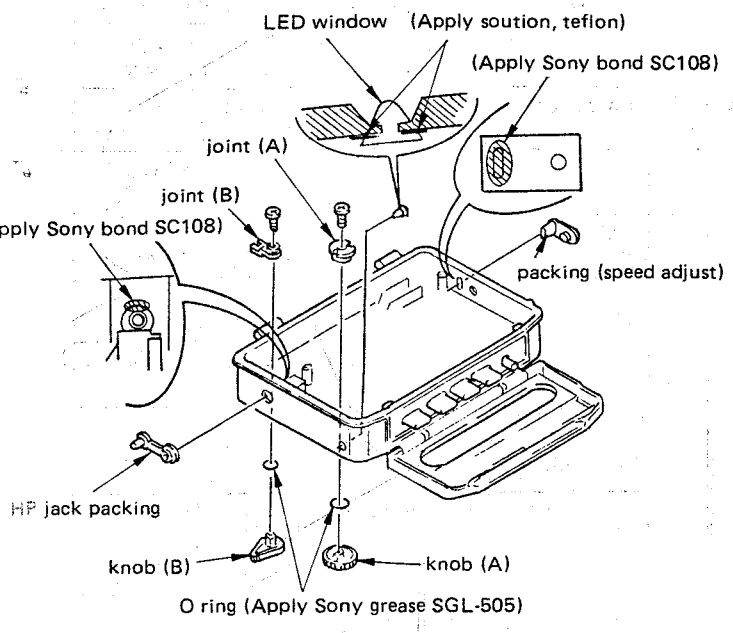


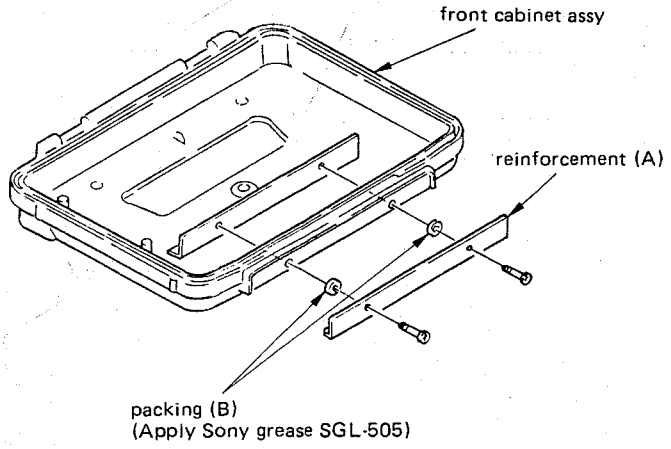




SECTION 2
NOTE ON REPAIR

2-1. WATERPROOFED SECTION

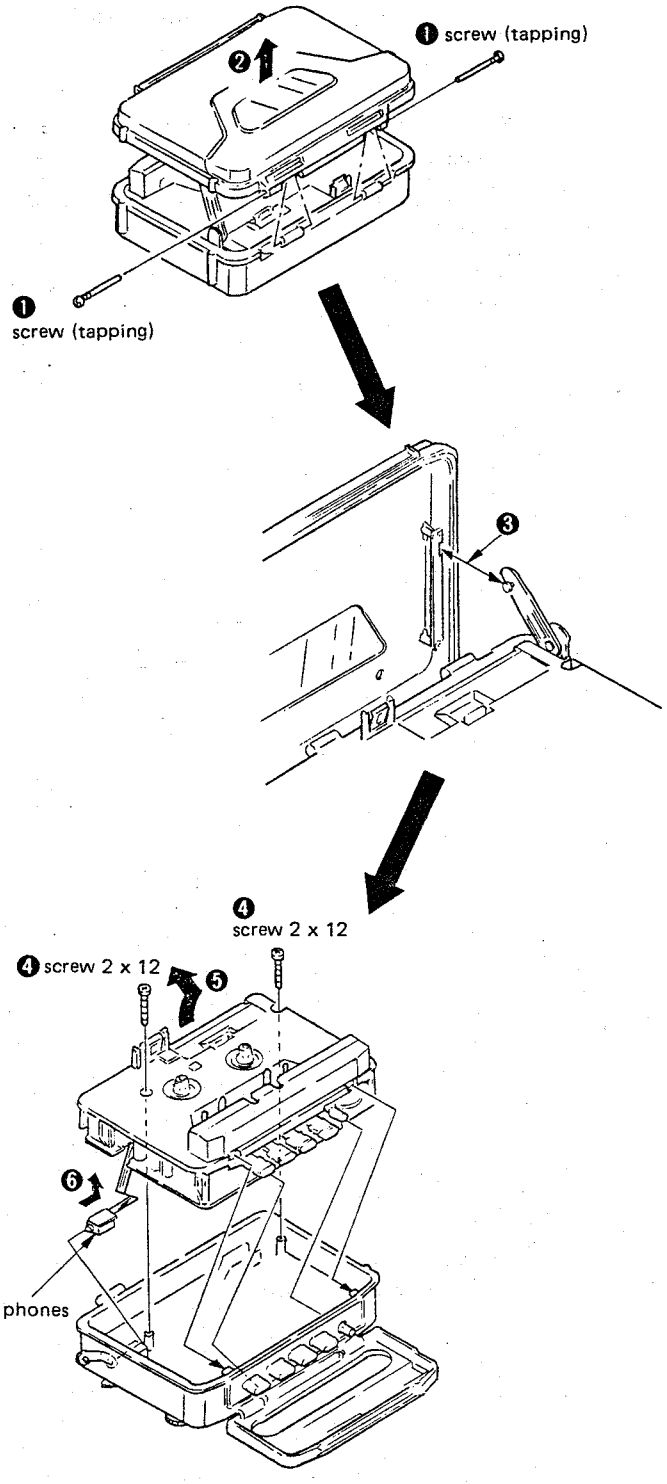




Solution teflon: 7-451-109-02
Sony bond SC108: 7-432-909-04
Sony grease SGL-505: 7-662-010-04

SECTION 3
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.



SECTION 4
ADJUSTMENTS

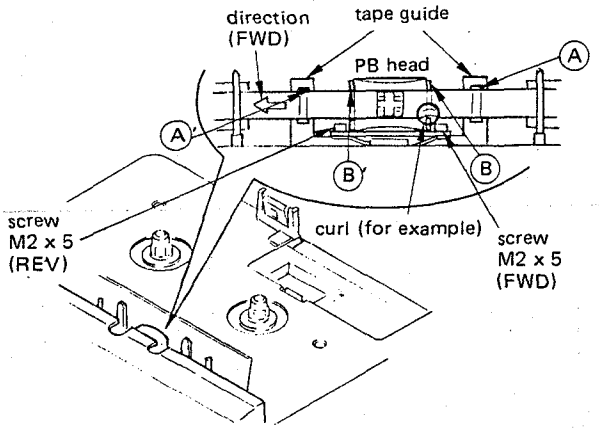
PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab:

   playback head — rubber belts
   capstan — idlers
   pinch roller

2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (3.0V) unless otherwise noted.

Playback Head Height Adjustment (Note on Playback Head Replacement)



1. Turn the screw M2 x 5 so that the (B) – (B)′ line of HEAD GUIDE becomes appraximately parallel to the (A) – (A)′ line of TAPE GUIDE.
2. When there is a tape curl on HEAD GUIDE ((B), (B)′) using a mirror cassette, turn the screw M2 x 5 to eliminate the tape curl.
   For example in the figure:
   (The curl marked ○ is eliminated by turning clockwise the screw M2 x 5 (right).)
3. Check in the REV mode by the same way as in the FWD mode.

4-1. MECHANICAL ADJUSTMENT

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	25 to 55 g·cm (0.35 to 0.76 oz·inch)
FWD Back Tension		1.5 to 4.5 g·cm (0.02 to 0.06 oz·inch)
REV	CQ-102RC	25 to 55 g·cm (0.35 to 0.76 oz·inch)
REV Back Tension		1.5 to 4.5 g·cm (0.02 to 0.06 oz·inch)
FF	CQ-201B	55 to 150 g·cm (0.76 to 2.1 oz·inch)
REW		55 to 150 g·cm (0.76 to 2.1 oz·inch)

Tape Pulling Force Measurement

Mode	Tension Meter	Meter Reading
FWD	CQ-403A	more than 45 g (more than 1.6 oz)
REV	CQ-403R	more than 45 g (more than 1.6 oz)

TEST TAPE

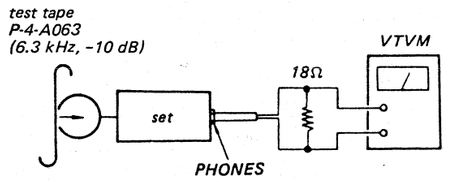
Type	Signal	Used for
WS-48A	3 kHz, 0 dB	Tape Speed Adjustment
P-4-A063	6.3 kHz, -10 dB	Dolby NR Head Azimuth Adjustment

4-2. ELECTRICAL ADJUSTMENTS

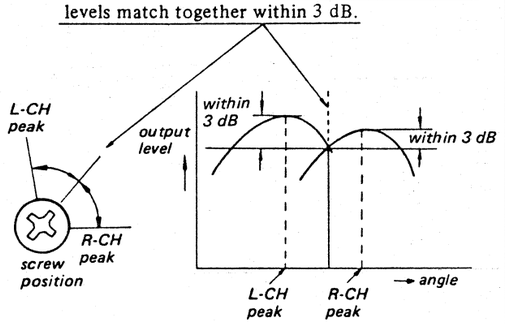
Playback Head Azimuth Adjustment

Procedure:

1. Playback mode



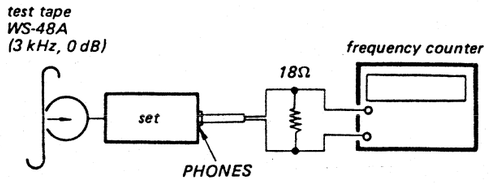
2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 3 dB.



Adjustment should be made in both directions of FWD and REV.
Adjustment screws should be stopped turning in the clockwise direction.
After the adjustment, lock the screws with locking compound.

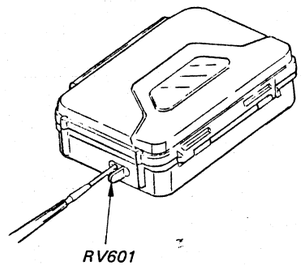
Tape Speed Adjustment

Procedure:



1. Play back WS-48A (Tape center portion) in FWD mode.
   Adjust the RV601 so that the frequency counter reads 3,000 ±90 Hz.
2. Play back WS-48A (Tape center portion) in REV mode.
   Confirm that the reading of frequency counter is within 1.5% from the reading in step 1.

Adjustment Location:



SECTION 5
DIAGRAMS

5-1. PRINTED WIRING BOARDS

Note:

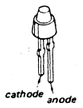
• ■ : parts mounted on the conductor side.

• Semiconductor Location

Ref. No.	Location
D301	D-5
IC301 IC601	C-4 B-3

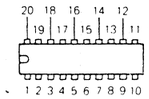
• Semiconductor Lead Layouts

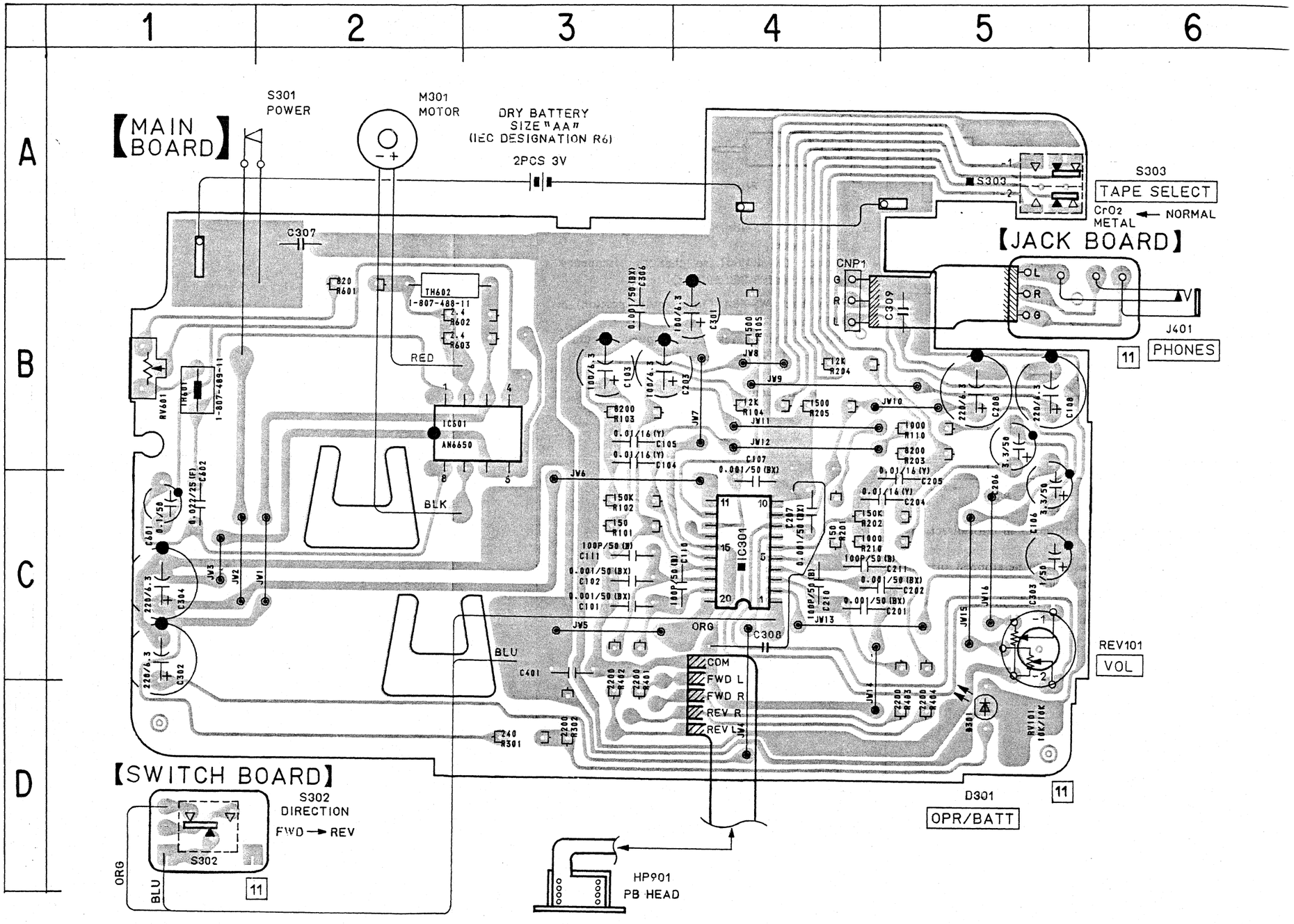
AN6650

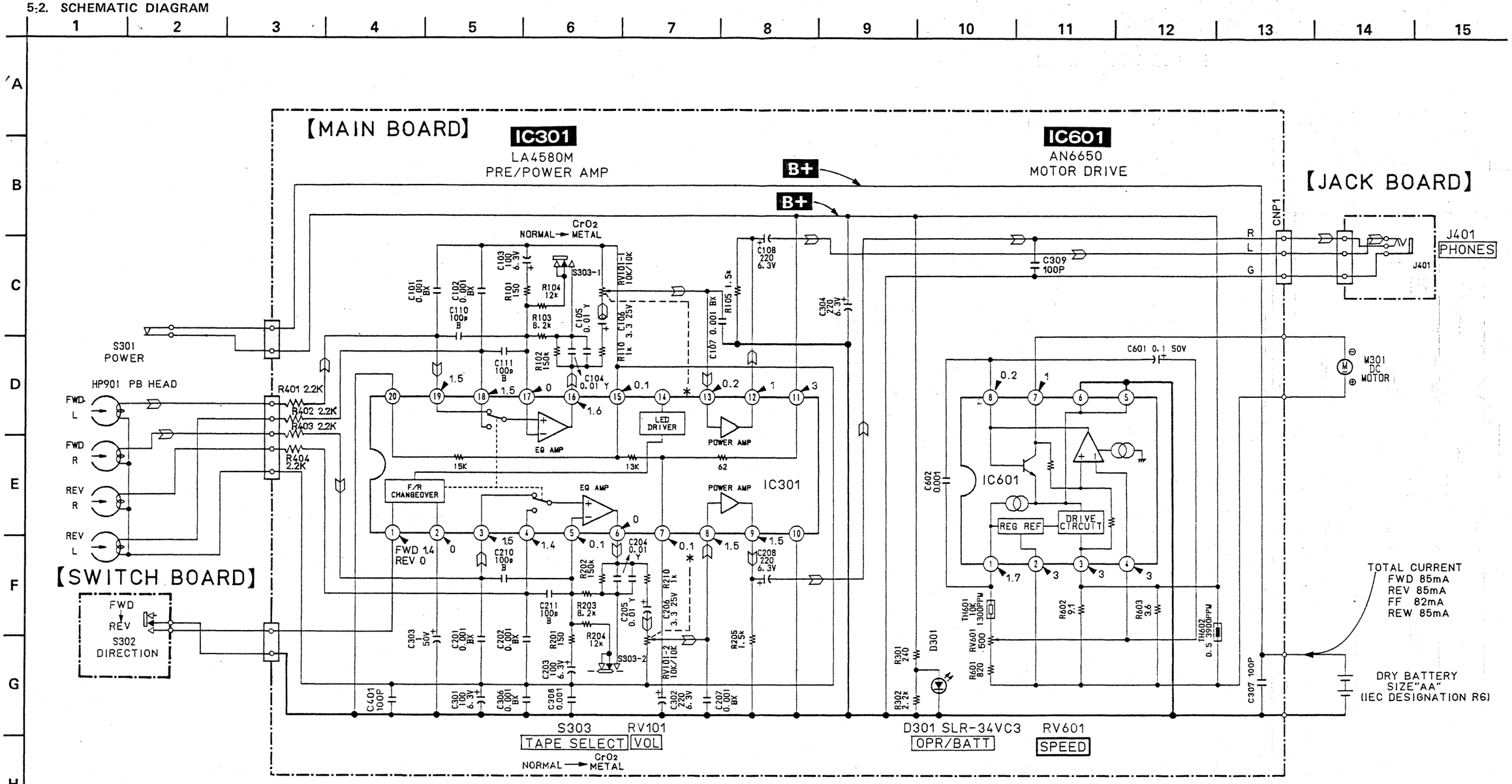


LA4580M

SLR-34VR70







Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ : B+ Line
- ▭ : adjustment for repair.
- Total current is measured with no cassette installed.
- Power voltage is dc 3 V and fed with regulated dc power supply from battery terminal.
- Voltage and waveforms are dc with respect to ground in playback mode.
- Voltages are taken with a VOM (input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ▷ : PB

SECTION 6
EXPLODED VIEWS

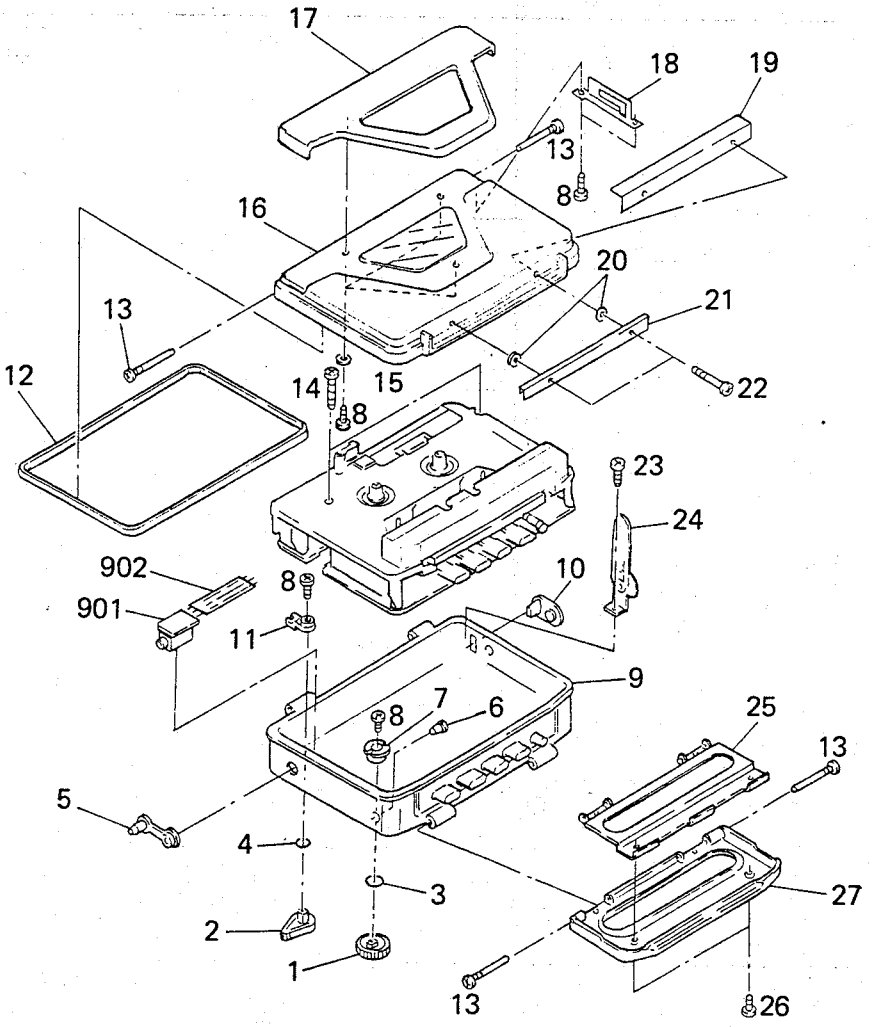
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) . . . KNOB, BALANCE (WHITE)
  ↑ ↑
  Cabinet's Color Parts' Color

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

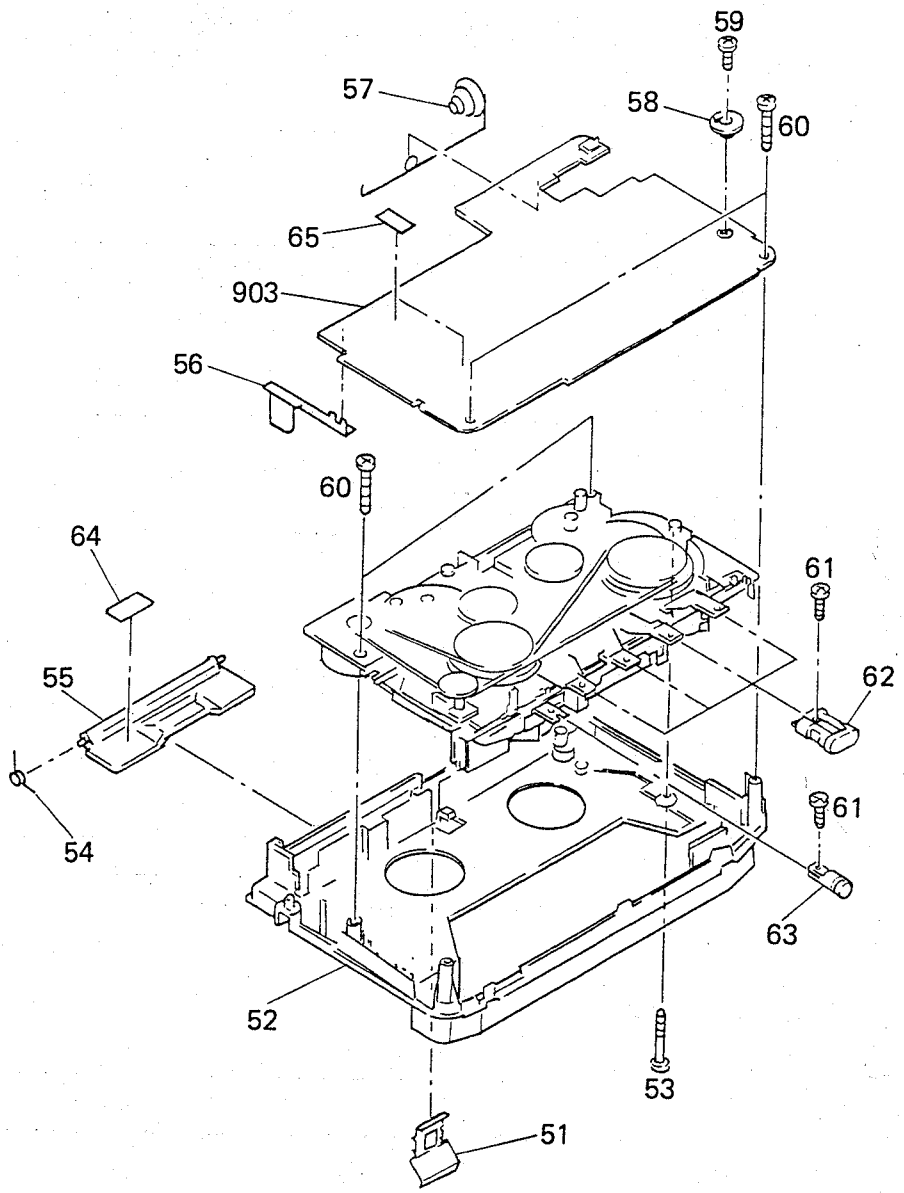
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifé.

(1) CABINET ASSEMBLIES



No.	Part No.	Description	Remarks
1	3-351-137-01	KNOB (A)	
2	3-351-136-01	KNOB (B)	
3	3-326-573-01	RING (DIA.4.9X DIA.7.1), O	
4	3-326-560-02	RING (DIA.2.5XDIA. 4.5), O	
5	3-326-520-01	PACKING, HP JACK	
6	3-326-519-01	WINDOW, LED	
7	3-351-138-01	JOINT (A)	
8	3-318-201-51	SCREW (B) (1.4X4), TAPPING	
9	X-3336-741-1	(B53:UK).....CABINET (REAR) ASSY	
	X-3336-742-1	(B53:E)..... ..CABINET (REAR) ASSY	
	X-3336-743-1	(A53,B53:AEP)...CABINET (REAR) ASSY	
10	3-312-826-00	PACKING(Speed Adjust)	
11	3-351-139-01	JOINT (B)	
12	3-351-134-01	PACKING, CABINET	
13	3-326-536-11	SCREW, TAPPING	
14	7-685-107-19	SCREW +P 2X12 TYPE2 NON-SLIT	
15	3-310-368-00	RING, RETAINING	
16	X-3336-737-1	(A53)....CABINET (FRONT) ASSY	
	X-3336-738-1	(B53)....CABINET (FRONT) ASSY	
17	3-351-156-01	PLATE, ORNAMENTAL	
18	*3-351-150-01	HOLDER (CLICK)	
19	*3-351-148-01	REINFORCEMENT (B)	
20	3-326-149-01	PACKING (B)	
21	*3-351-147-01	REINFORCEMENT (A)	
22	3-326-145-21	SCREW (M1.7X6.8)	
23	7-685-103-19	SCREW +P 2X5 TYPE2 NON-SLIT	
24	X-3336-727-1	ARM ASSY, CLICK	
25	*3-351-146-01	BRACKET (BUCKLE)	
26	3-704-243-11	SCREW (P1.7X2.0)	
27	3-351-135-01	BUCKLE	
901	*1-630-794-11	PC BOARD, JACK	
902	1-574-787-11	CABLE, FLAT (2.5MM PITCH)	

(2) CHASSIS

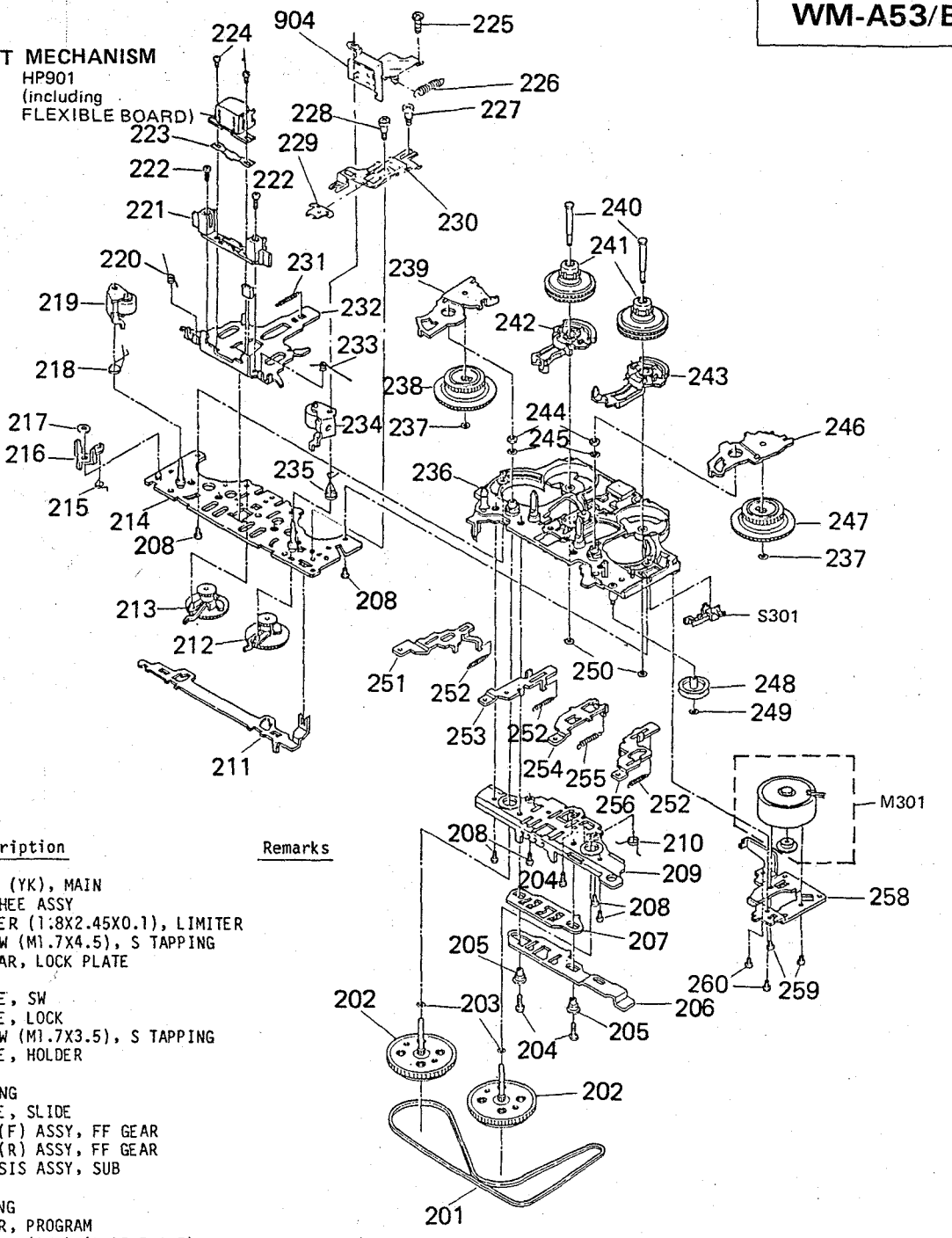


No.	Part No.	Description	Remarks
51	3-351-153-01	SPRING	
52	*3-351-162-01	CHASSIS	
53	7-627-852-67	SCREW, PRECISION +P 1.7X6 TYPE3	
54	3-326-134-01	SPRING, TORSION	
55	3-351-142-01	LID, BATTERY CASE	
56	3-351-151-01	TERMINAL BOARD, BATTERY	
57	3-351-152-01	SPRING	
58	3-351-140-01	JOINT (D)	

No.	Part No.	Description	Remarks
59	3-318-201-51	SCREW (B) (1.4X4), TAPPING	
60	7-685-103-19	SCREW +P 2X5 TYPE2 NON-SLIT	
61	7-627-552-07	SCREW (M1.7X2.5), TAPPING	
62	3-351-141-01	BUTTON (A)	
63	3-351-143-01	BUTTON (B)	
64	9-911-850-XX	FELT	
65	3-831-441-XX	SPACER, KNOB	
903	*A-3015-765-A	PC BOARD ASSY, MAIN	

(3) TAPE TRANSPORT MECHANISM (MT-WMA53)

HP901 (including FLEXIBLE BOARD)



No.	Part No.	Description	Remarks
201	3-395-041-01	BELT (YK), MAIN	
202	3-395-040-01	FLYWHEE ASSY	
203	3-395-057-01	WASHER (1.8X2.45X0.1), LIMITER	
204	3-395-047-01	SCREW (M1.7X4.5), S TAPPING	
205	3-395-015-01	COLLAR, LOCK PLATE	
206	*3-395-014-01	PLATE, SW	
207	*3-395-013-01	PLATE, LOCK	
208	3-395-046-01	SCREW (M1.7X3.5), S TAPPING	
209	*3-395-010-01	PLATE, HOLDER	
210	3-395-011-01	SPRING	
211	*3-395-003-01	PLATE, SLIDE	
212	3-395-004-01	ARM (F) ASSY, FF GEAR	
213	3-395-005-01	ARM (R) ASSY, FF GEAR	
214	*3-395-002-01	CHASSIS ASSY, SUB	
215	3-395-035-01	SPRING	
216	3-395-034-01	LEVER, PROGRAM	
217	3-395-053-01	WASHER (CUT) (1.85X5X0.5), P	
218	3-395-019-01	SPRING (R)	
219	3-395-030-01	PINCH ROLLER (R) ASSY	
220	3-395-022-01	SPRING (R)	
221	3-395-023-01	GUIDE, TAPE	
222	3-395-048-01	SCREW (M2X5)	
223	3-395-025-01	PLATE, SPRING, HEAD	
224	3-395-049-01	SCREW (M2X4), + - (SPECIAL)	
225	3-351-132-01	SCREW	
226	3-351-160-01	SPRING, TENSION	
227	3-351-131-01	SCREW, STEP	
228	3-351-131-11	SCREW, STEP	
229	*3-351-127-01	LEVER (A)	
230	*X-3336-729-1	LEVER (B) ASSY	
231	3-395-027-01	SPRING	
232	*3-395-020-01	PANEL (V), HEAD	
233	3-395-021-01	SPRING (F)	
234	3-395-029-01	PINCH ROLLER (F) ASSY	
235	3-395-018-01	SPRING (F)	
236	*3-395-001-01	CHASSIS ASSY	
237	3-395-054-01	WASHER (CUT) (0.8X2.4X0.25),HL	
238	3-395-032-01	GEAR (R), T CAM	
239	3-395-017-01	ARM (R) ASSY, T GEAR	
240	3-395-039-01	SHAFT, REEL	
241	3-395-038-01	REEL ASSY	
242	3-395-037-01	LEVER (R) ASSY, AUTO	
243	3-395-036-01	LEVER (F) ASSY, AUTO	
244	3-395-059-01	WASHER (1.45X3.2X0.5), HL	
245	3-395-058-01	WASHER (1.85X3.2X0.2), P	
246	3-395-016-01	ARM (F) ASSY, T GEAR	
247	3-395-031-01	GEAR (F), T CAM	
248	3-395-033-01	PULLEY, SUB	
249	3-395-055-01	WASHER (CUT) (0.85X2.8X0.25),P	
250	3-395-056-01	WASHER (CUT)(1.13X3.6X0.25),HL	
251	*3-395-008-01	LEVER (V), STOP	
252	3-395-045-01	SPRING	
253	*3-395-007-01	LEVER (R) (V), FF	
254	*3-395-009-01	LEVER (V), PLAY	
255	3-395-028-01	SPRING	
256	*3-395-006-01	LEVER (F) (V), FF	
258	*3-395-042-01	BRACKET, MOTOR	
259	3-395-051-01	SCREW (M1.7X1.6), CAMERA	
260	3-395-052-01	SCREW (M1.7X3), PS TAPPING	
904	*1-630-793-11	PC BOARD, SWITCH	
HP901	1-543-633-11	HEAD, MAGNETIC (PLAYBACK)	
M301	X-3336-744-1	MOTOR, ASSY	
S301	1-571-951-11	SWITCH, LEAF (POWER)	

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description			
901	*1-630-794-11	PC BOARD, JACK			
902	1-574-787-11	CABLE, FLAT (2.5MM PITCH)			
903	*A-3015-765-A	PC BOARD ASSY, MAIN			
904	*1-630-793-11	PC BOARD, SWITCH			
C101	1-162-294-31	CERAMIC	0.001MF	10%	50V
C102	1-162-294-31	CERAMIC	0.001MF	10%	50V
C103	1-126-177-11	ELECT	100MF	20%	6.3V
C104	1-161-379-00	CERAMIC	0.01MF	30%	16V
C105	1-161-379-00	CERAMIC	0.01MF	30%	16V
C106	1-123-382-00	ELECT	3.3MF	20%	50V
C107	1-162-294-31	CERAMIC	0.001MF	10%	50V
C108	1-126-335-11	ELECT	220MF	20%	6.3V
C110	1-162-282-31	CERAMIC	100PF	10%	50V
C111	1-162-282-31	CERAMIC	100PF	10%	50V
C201	1-162-294-31	CERAMIC	0.001MF	10%	50V
C202	1-162-294-31	CERAMIC	0.001MF	10%	50V
C203	1-126-177-11	ELECT	100MF	20%	6.3V
C204	1-161-379-00	CERAMIC	0.01MF	30%	16V
C205	1-161-379-00	CERAMIC	0.01MF	30%	16V
C206	1-123-382-00	ELECT	3.3MF	20%	50V
C207	1-162-294-31	CERAMIC	0.001MF	10%	50V
C208	1-126-335-11	ELECT	220MF	20%	6.3V
C210	1-162-282-31	CERAMIC	100PF	10%	50V
C211	1-162-282-31	CERAMIC	100PF	10%	50V
C301	1-126-177-11	ELECT	100MF	20%	6.3V
C302	1-126-335-11	ELECT	220MF	20%	6.3V
C303	1-124-499-11	ELECT	1MF	20%	50V
C304	1-126-335-11	ELECT	220MF	20%	6.3V
C306	1-162-294-31	CERAMIC	0.001MF	10%	50V
C307	1-162-282-31	CERAMIC	100PF	10%	50V
C308	1-162-294-31	CERAMIC	0.001MF	10%	50V
C309	1-162-282-31	CERAMIC	100PF	10%	50V
C401	1-162-282-31	CERAMIC	100PF	10%	50V
C601	1-124-463-00	ELECT	0.1MF	20%	50V
C602	1-162-294-31	CERAMIC	0.001MF	10%	50V
CNP1	1-568-596-11	CONNECTOR, FC 5P			
D301	1-807-738-11	DIODE SLR-34VR70F130 (LED)			
HP901	1-543-633-11	HEAD, MAGNETIC (PLAYBACK)			
IC301	8-759-820-66	IC LA4580M			
IC601	8-759-403-83	IC AN6650			
J401	1-563-298-11	JACK (SMALL TYPE) (DIA. 3.5)(PHONES)			
M301	X-3336-744-1	MOTOR, ASSY			

Ref.No.	Part No.	Description			
R101	1-249-407-11	CARBON	150	5%	1/4W
R102	1-247-883-00	CARBON	150K	5%	1/4W
R103	1-249-428-11	CARBON	8.2K	5%	1/4W
R104	1-249-430-11	CARBON	12K	5%	1/4W
R105	1-249-419-11	CARBON	1.5K	5%	1/4W
R110	1-249-417-11	CARBON	1K	5%	1/4W
R201	1-249-407-11	CARBON	150	5%	1/4W
R202	1-247-883-00	CARBON	150K	5%	1/4W
R203	1-249-428-11	CARBON	8.2K	5%	1/4W
R204	1-249-430-11	CARBON	12K	5%	1/4W
R205	1-249-419-11	CARBON	1.5K	5%	1/4W
R210	1-249-417-11	CARBON	1K	5%	1/4W
R301	1-247-816-11	CARBON	240	5%	1/4W
R302	1-249-421-11	CARBON	2.2K	5%	1/4W
R401	1-249-421-11	CARBON	2.2K	5%	1/4W
R402	1-249-421-11	CARBON	2.2K	5%	1/4W
R403	1-249-421-11	CARBON	2.2K	5%	1/4W
R404	1-249-421-11	CARBON	2.2K	5%	1/4W
R601	1-249-416-11	CARBON	820	5%	1/4W
R602	1-247-782-91	CARBON	9.1	5%	1/4W
R603	1-247-772-91	CARBON	3.6	5%	1/4W
RV101	1-230-593-11	RES, VAR, CARBON 10K/10K (VOL)			
RV601	1-238-594-11	RES, ADJ, CARBON 500 (SPEED)			
S301	1-571-951-11	SWITCH, LEAF (POWER)			
S302	1-570-355-11	SWITCH, SLIDE (DIRECTION)			
S303	1-571-674-11	SWITCH, SLIDE (TAPE SELECT)			
TH601	1-807-488-11	THERMISTOR (POSITIVE)			
TH602	1-808-680-11	THERMISTOR (POSITIVE)			

ACCESSORY & PACKING MATERIAL

*3-351-178-01	(A53:US).....CUSHION (UPPER)
*3-351-179-01	(A53:US).....CUSHION (LOWER)
*3-351-182-01	(A53:Canadian,B53)...CUSHION (UPPER)
*3-351-183-01	(A53:Canadian,B53)...CUSHION (LOWER)
*3-351-184-01	(A53:Canadian)...INDUVIDUAL CARTON
*3-351-186-01	(B53:AEP).....INDUVIDUAL CARTON
*3-351-190-01	(B53:E).....INDUVIDUAL CARTON
3-750-305-11	(A53:Canadian,B53)...MANUAL, INSTRUCTION
3-750-305-21	(A53:US).....MANUAL, INSTRUCTION
3-750-305-41	(A53:AEP).....MANUAL, INSTRUCTION
8-952-261-90	(A53,B53:AEP)...HEADPHONE MDR-W15L/Y SET
8-952-265-90	(B53:E).....HEADPHONE MDR-E215/Y SET
X-3336-728-1	CASE ASSY, CARRYING

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